ELECTRICITY IN GYNECOLOGY.

BY

AUGUSTIN H. GOELET, M.D.

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Address:—P. O. Box, 2535
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Editor American Medico-Surgical Bulletin.

ELECTRICITY IN GYNECOLOGY.*

By AUGUSTIN H. GOELET, M.D.

THAT electricity is a valuable therapeutic agent in female pelvic disorders will not be denied by any one who has had even a limited experience with it, but those who have employed it extensively, according to modern methods, have come to realize that it is absolutely indispensable, even more so than opium, for the relief of pain. Therefore, the physician who would keep abreast with the advance in practical therapeutics, and who has the interest of his patients at heart, cannot afford to leave it untried because some have seen fit to oppose it. That its use has extended, and its influence upon gynecological methods has continued to increase in the face of opposition from some of the most prominent members of the profession, are evidence of its merit, and should be sufficient to stimulate those who have not done so to test it for themselves and ascertain the truth.

The claim is not that electricity is a panacea for all the ills that women are heir to, but that it is possible to do more, and many times do it better, with this than with any other agent at our command. True, in

* Being a contribution to the discussion "Electricity in Medicine, from a Modern Standpoint" at the Meeting of the New York State Medical Society held at Albany, Feb. 5, 6, and 7, 1895.

some instances, it is to be regarded only as an auxiliary to other measures, often operative, but in others successful results may be reached with it practically unaided. One very decided advantage in its favor is that the general practitioner, by familiarizing himself with its application, can cure many of his gynecological cases himself, instead of sending them to the specialist.

Let us review briefly what may be accomplished by electricity in gynecological conditions and study the rationale of its action.

The electrolytic action of the galvanic or constant current, the exact nature of which is now pretty clearly understood, serves many useful purposes, and is susceptible of variation, according to the pole employed and the method of application. We now know that there is not only a negative and a positive electrolysis, which are widely different, both in chemical results and therapeutic action, but that there is an interpolar electrolysis, which exerts a very decided influence upon physiological action.

Negative electrolysis by liberating the bases and hydrogen produces softening and relaxation and stimulates absorption of effete products. When applied directly to a mucous surface, such as the uterine canal, an active cauterization can be produced if the current is made sufficiently strong.

Positive electrolysis, which results in the liberation of the acids, chlorine, and oxygen from the tissues, produces a drying effect, in which it is aided by the cataphoric action of the current (or that power possessed by the current of influencing fluids to move in the direction of the current from the positive

to the negative pole). Likewise the liberated chlorine and oxygen exert a germicidal action and the acids produce a peculiar acid cauterization. The action of positive electrolysis, then, upon a mucous surface may be regarded as an astringent or drying acid caustic, the intensity of the action depending upon the strength of the current. The cataphoric action serves a very useful purpose in promoting the absorption of fluid effusions, infiltrations, and extravasations.

So far as it has been possible to observe, interpolar electrolysis results in: 1. A forced elimination of the watery or fluid portion of the tissues through which the current is made to pass and, consequently, a shrinkage and loss of weight; 2, when a strong current, greatly concentrated, is employed, the characteristic of muscular structure is materially altered; that is, it becomes structureless or granular.

When a metal other than platinum or gold (which, owing to their not being oxidizable, are the only metals which can be employed for producing positive electrolysis) is used as an electrode for the positive pole, it is attacked by the oxygen, chlorine, and acids, instead of the tissues, and, in consequence, we have a metallic electrolysis, which results in the formation of an oxychloride of the metal employed. This salt is deposited upon the surface to which the electrode is applied, and the cataphoric action of the current causes it to be transmitted to a considerable distance beneath. This process has been utilized to advantage not only in intensifying the germicidal action of the positive pole, but as a means of applying the salt of

the metal employed to any surface where its action is desired. Thus, by employing copper in this manner, a strong antiseptic astringent salt, the oxychloride of copper, is obtained. The oxychloride of zinc obtained in this manner produces a moderate astringent cauterization, but which is nothing like so destructive in its action as the ordinary chloride of zinc. The intensity of the action can, of course, be varied by varying the strength of the current. Silver and tin have also been employed, and have been found to serve a useful purpose, because the salts of these metals thus formed are moderate, non-irritating astringents.

This method of topical medication may be regarded as one of the greatest advances in modern therapeutics.

We come now to the consideration of a form of electricity which has not been fully appreciated by the greater part of the profession, chiefly because until very recently satisfactory apparatus could not be obtained, and because literature bearing upon its application is meager. I refer to periodical induced currents, which include the faradic, alternating, and static induced.

Of these three forms of induced currents the faradic is the most generally useful, because it is applicable to a greater number of conditions and the apparatus for its production is more readily obtainable. More stress will therefore be laid upon this in the present paper.

The principal advantages in the use of electricity in this form are its property of allaying pain, relieving congestion and engorgement, increasing nutrition, and pro-

moting absorption of exudates, infiltrations, and extravasations in the pelvis. It is to be regarded as a form of painless stimulation incomparable with any other therapeutic measure we possess. It will accomplish all that hot water will do, and much more, in a more satisfactory manner. It will relieve the pain of inflammatory conditions more promptly and more permanently than opium without disagreeable after-effects. For promoting absorption of infiltrations and exudates it is superior to the galvanic current.

It will be interesting to study the action of periodical currents, and see how these results are brought about.

Pain is relieved and sedation is established by intense stimulation of the sensory and motor nerves, resulting in temporary suspension of their function. The rapid succession of impulses seems to induce a condition of concussion of the nerve filaments, and the tetanic rigidity of the muscles, by wearing out their contractibility, produces relaxation, and the parts are put at rest by obviating the painful contraction of surrounding muscles.

Congestion is relieved and absorption hastened by stimulating the capillary circulation and lymphatics to increased activity, which is brought about by the effect of the current upon the vaso motor supply. These results are, of course, to be obtained only by the high-tension faradic, alternating, or static induced currents.

The coarse-wire faradic current acts more directly as a muscle stimulator, is more local in its action, and is useful in restoring tone to impaired muscle tissue.

It may be readily surmised that an agent possessing the properties enumerated here will prove very useful in combating pelvic disease, and if it is not always possible for it to effect a cure alone, it must prove a valuable auxiliary which we cannot afford to ignore.

It would consume more time than is allowed in this discussion to enumerate the different conditions where this agent may be employed to advantage. What has already been said should be sufficient to show the rationale of its action. There is one point, however, which is important, but which has not been mentioned, viz.: That the peculiar action of the negative pole may be utilized for overcoming obstruction in the cervical canal, thus establishing drainage from the uterine cavity, which is so essential in the treatment of endometritis and salpingitis. In some instances these cases can be treated quite as satisfactorily in this manner as by curettage and gauze packing, and the use of an anesthetic and subsequent confinement to bed can thus be avoided.

The fine-wire faradic current also serves a very useful purpose in these cases, especially in salpingitis. Here it acts by removing the congestion and infiltration in and around the tubes, thus overcoming the obstruction in their caliber due to tumefaction; and by stimulating contraction of their walls, causing them to empty and drain into the uterus. In this manner many of these cases can be cured.

Mild cases of endometritis, such as the catarrhal variety, may be cured by this method of treatment, viz.:

Moderate (10 M) negative galvanic applications to the whole length of the canal, followed by faradization to overcome the associated hyperemia. In cases of a more aggravated type, metallic electrolysis may be employed with advantage, and will yield good results. It is quite important, however, in making such applications to the endometrium to preserve a patulous condition of the cervical canal for drainage, and, in some instances, it will be necessary to free the surface of the endometrium of retained secretions by irrigation of the cavity previous to making the application. This latter precaution is particularly essential in employing the current in this manner for the control of hemorrhage, since the accumulated blood and clots prevent the necessary action upon the mucous membrane.

The fine-wire faradic current is likewise particularly effective in relieving the pain and congestion of chronic ovaritis and salpingitis and promoting the absorption of surrounding exudates.

But to say more in this connection would be a repetition and unprofitable unless the time were sufficient to take up the different conditions separately and detail the method to be adopted in applying the current in each.

The essential elements for success in employing this agent in gynecology are:

1. Some knowledge of electro-physics and electro-physiology.
2. A fair ability to diagnose correctly, and
3. Proper apparatus.

The general practitioner must disabuse his mind of the idea that the old and cheaper

forms of apparatus (faradic in particular) will answer his purpose because he does not expect to go into the subject as a specialist would do. Good work cannot be done with imperfect tools or slipshod methods.

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